THE
VETERINARY JOURNAL

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Obituary

THE LATE MR. ROBERT CADWALLADER TRIGGER, J.P., F.R.C.V.S.

In our last issue we published as our frontispiece the portrait of the late Professor Penberthy, and it is a curious coincidence that this following number should have that of one of his greatest College friends.

As in the case of the London teacher the profession lost one of its landmarks so, in a different sphere, the practitioner will miss, by the death of Mr. Robert Trigger, one of its brightest ornaments; for no man was ever held in higher esteem amongst his colleagues or amongst his *clientèle*.

Born in 1848, he graduated in London in 1870, having previously served his indentures (as was the custom in those days) as an articled pupil with a busy practitioner. In Mr. Trigger's case the choice of a preceptor fell upon Mr. Cartwright, of Wolverhampton, and it was here that what proved to be a life-long friendship commenced with another future President of the profession, the late Mr. William Hunting.

Taking over an old-established practice at Newcastle-under-Lyme, Mr. Trigger soon proved his professional worth, and his opinion was sought and valued, not only by a very extensive *clientèle*, but also by his professional neighbours. In the social life of the town, especially in the directions whereby the poor and suffering could be benefited, Mr. Trigger took a most prominent part, and in 1910 (although he had never sought election to the Town Council) he was paid the very high compliment of being selected as the Mayor, a position which he served with so much distinction that he was re-elected in 1911 and held office for a further 12 months. He had previously been made a Justice of the Peace in 1897

and he retained this honour until his death, becoming the Senior Magistrate the Bench. Wherever good work was being done in the cause of charity on or for the benefit of the town, Mr. Trigger's name was to be found amongst the list of helpers, and with all his busy life he found time, too, to further the advancement of his own profession.

A prominent worker on the Council of the Royal College for no less than 34 consecutive years, his genial presence and ever-ready practical advice were much missed by his brother Councilmen when, in 1924, he decided to retire. He had been honoured by election to the office of President in 1896, and the Presidential Chairs of the National Veterinary Association and the Midland Society had also fallen to his lot.

His life was one long sphere of useful activity and kindliness; and an example to be followed by every man whose aim is to leave his world, professional as well as personal, on a higher plane than where he originally found it.

Editorials

THE HISTORY OF THE ROYAL ARMY VETERINARY CORPS.

We review elsewhere in this number Major-General Sir Frederick Smith's "History of the Royal Army Veterinary Corps," just published, but it is impossible to appraise adequately a work of such outstanding merit in the short space of a review. There is no question that this latest of the labours of Sir Frederick Smith will be read with the keenest interest by all officers of the R.A.V.C. The author's enthusiasm for his subject is felt throughout its pages, and everywhere is evidenced his thorough grasp of it; the knowledge of the workman, who, having to build on foundations laid by others, critically surveyed them, knew their defects, and contributed his own masterly share to complete the structure in such a way as most efficiently to serve its purpose.

In the work there are criticisms which are damning, yet not without complete reasons for their severity. Professor Coleman of the London School, who was made Principal Veterinary Surgeon to the Cavalry in 1796, was responsible for the production of "Instructions to Army Farriers," which, from actual quotations of the contents, were obviously "a disgrace to the age and nation for which they were written." After describing impartially his work, good and bad, an exhaustive and telling exposure of his aims and methods is given, and the author concludes: "With a full consciousness of the value of words, and after reading everything he wrote and everything written for and against him, I concur with the opinion of F. C. Cherry . . . that Coleman was the greatest enemy the profession has ever had in its highest ranks." But happily there is cause for pleasure and pride in the work of others, and of William Percivall, to whom

the book is dedicated, the author writes, " William Percivall was the greatest man the Army Veterinary Service has produced ; we are proud to think that one so gifted belonged to our ranks. His name will be remembered so long as the veterinary profession lasts."

The old controversies and struggles of a century ago are here retold with as much insight as if the author had lived among them, and the same complete familiarity with men and events is displayed as the story proceeds. It ends with the Great War, and the description of the means by which, when the test came, the Army Veterinary Service was found ready, and able to expand itself to meet all needs, and finally to demobilise without the occurrence of a single case of infectious outbreak. " We cleared up as we went along. No disease was left behind in the various countries, and no disease introduced into this country."

This is the story of an achievement. Out of a century-long struggle towards perfection of development there emerges the finest veterinary service the world has ever seen, the admiration and the envy of the Veterinary Services in two hemispheres. Written in clear and easy English, it is another imperishable monument to the enthusiasm, industry, and genius, of its author.

WHOLE TIME VETERINARY APPOINTMENTS.

WHOLE time appointments are, at the present time, much sought after, and one is pleased to see how much more satisfactory these positions are in regard to emolument and prospects than they were even only a few years ago. To the younger graduate who does not care for the responsibilities of practice (about which he knows so very little when he has been awarded his diploma) the whole time appointment offers an outlet which has improved very materially from the financial side during the past few years. In fact, these positions are now worth having, as the commencing salary is a living wage and the prospects in front are by no means to be despised.

To ensure future success the added Public Health hall-mark qualification given to the possessor of the Diploma in Veterinary State Medicine should always be obtained as early as possible after acquiring the Membership of the College ; and the man who enters the Public Health Service should make up his mind that he is going to continue in this sphere. It is only by continued application to the problems of disease that he can hope to attain one or other of the highest positions in this Service.

The following appointments have been made recently :—Mr. Andrew Alexander, M.R.C.V.S., D.V.S.M., Senior Inspector to the County of

Ayr, appointed Veterinary Surgeon to the Salford Corporation at a salary of £400, rising to £600, plus bonus; Mr. W. Rutherford Wallace, M.R.C.V.S., Veterinary Officer, Municipality of Georgetown, Penang, Straits Settlements; Capt. F. William Medlock, M.R.C.V.S., County Veterinary Officer, Surrey; Capt. R. Wooff, M.R.C.V.S., County Veterinary Officer, Hereford; Mr. G. F. Elliott, M.R.C.V.S., Government Veterinary Officer, Northern Rhodesia; Mr. R. B. H. Murray, M.R.C.V.S., Lecturer, Canterbury Agricultural College, New Zealand; Mr. D. R. Wilson, B.Sc., M.R.C.V.S., Assistant, Animal Diseases Research Association of Scotland.

In connection with this subject it is interesting to note that in America at the present moment an attempt is being made to raise the present miserable salaries given to the Bureau Government Veterinary Officials, upon which it is stated that they can barely exist, and the July issue of *Veterinary Medicine* has a long article upon the subject; including a very straight (but courteously) worded letter from the President of the National Association of Bureau of Animal Industry Veterinarians to the Chief of the Bureau, in which it states, " Indeed it may be stated as an absolute fact that individually and as a group the Bureau Veterinarians are the most underpaid of any professional men employed by the United States Government."

It is only a short time ago that the same complaint was levelled at our own Government Service, which, although slightly improved from what it was then (especially in regard to the commencing salaries) is by no means up to the standard which is likely to command and keep the best men and the best brains of the profession.

General Articles

DEVELOPMENT OF VETERINARY SCIENCE AND ITS GREAT VALUE IN OUR AFRICAN COLONIES.

Extract from a Paper, *British West Africa*, by the
RT. HON. W. G. A. ORMSBY-GORE, M.P.,
*Parliamentary Under-Secretary of State for the Colonies.**

CLOSELY allied to, and in many ways interlocked with, the problems of human health, are those of the veterinary department. To the general public in England the conception of a veterinary surgeon conjures up the spectacle of a man who passes an animal sound or unsound at a horse fair. In Nigeria it conjures up the spectacle of a few individuals—all too few—who are fighting rinderpest or tsetse borne cattle disease against tremendous odds, and who have little

* " United Empire," the Royal Colonial Institute Journal, Vol. XVIII, No. 1, January, 1927, pp. 28-41.

time to devote to the problems of animal genetics, animal husbandry, and the development of the use of the animal in agricultural industry. The plough has not yet been introduced into West Africa ; agriculture is still in the primitive stage of the hand hoe.

Animals in tropical Africa, like man, are subject to epidemics on a scale and of an intensity seldom realised, and the supply is totally inadequate for transport or for the manure of crops.

It has been said of the development of veterinary science, in the widest interpretation that can be given to the term, that it has been the life and death of South Africa, and that is why, perhaps, if I am to express my own personal opinion, so much more attention has been paid to it in that country than in most other countries of the world. It is equally the life and death in tropical Africa, and there is no side of scientific endeavour which I should be more pleased to see developed than animal husbandry and animal industry. I feel we want to raise the whole standard and widen the whole sphere of the veterinarian, and to bring all science to work in this field. The advance of medical science on the one hand is nowadays so closely bound up with the advance of veterinary science ; and veterinary science is nowadays so closely bound up with the future of agriculture—by which I mean crop production—that I pass on at once to this latter subject, etc.

THE PUNJAB VETERINARY COLLEGE, LAHORE.

By G. K. WALKER, C.I.E., O.B.E., F.R.C.V.S.,
late Principal.

THE Punjab Veterinary College was founded in 1882 as the Lahore Veterinary School, the first Principal being Veterinary Lieutenant-Colonel Kettlewell, of the Indian Veterinary Department. It was primarily established in order to train *salutris*, as veterinary assistants were then termed, for the Horse Breeding Department and the Indian Cavalry Regiments. The latter were enlisted soldiers (*sowars*), who were sent to the School from their regiments for training. Instruction was given in *Urdu*, the most convenient vernacular tongue, and the requisite text books were compiled in that language. The course consisted of two years' training and fulfilled its purpose for the time being with excellent results. The Principal had the assistance of an army veterinary officer and a staff of Indian teachers who were specially selected from *alumni* possessing notable intellectual attainments. Anatomy was taken by Burke, an employée in the Horse Breeding Department, who became very efficient in the subject. Materia Medica was taught by an assistant surgeon specially transferred from the Medical Department. Officers who were connected with the School at this period of its existence include Gunn, Blenkinsop,

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Nunn (who succeeded Kettlewell as Principal), Pease, Sullivan, and Martin. Pease succeeded Nunn and was especially distinguished for his industrious contributions to vernacular literature.

Notable Indian officers were Khan Bahadur Amir Shah, Khan Bahadur Mehtab Shah, and Khan Bahadur Sirdar Shah.

In course of time the School extended its activities to include civilian students for work in the districts and these gradually increased as their services became appreciated. At that time they were employed under local bodies in connection with horse breeding and cattle disease.

Later, the course of study was increased to three years in *Urdu*, and the name of the Institution was changed to the present one. Hitherto the graduates of the College had been trained mainly with the intention of employing them as assistants under the immediate supervision of British Officers of the Army and Horse Breeding Departments. They earned great credit for the way in which they performed these duties, particularly in the field, and their services were especially valuable in the various Indian Cavalry regiments where they had considerable professional independence in equine surgery. As the necessity for employing a larger and more efficient staff for dealing with epizootic diseases became more evident to the authorities a demand for increased knowledge and efficiency, particularly on the side of the civil assistants, arose, and it became clear that without the introduction of a higher course of instruction, necessitating a longer period of study, progress could not be expected.

An attempt was made to introduce a four years' course in *Urdu* for civilian students to be carried on simultaneously with a three years' course for military students. It was commenced but did not materialise, owing to various reasons, one of which was the incidence of the Great War.

In 1919 the present Principal took over charge, and with the approval of the military authorities obtained the sanction of Government to the introduction of a four years' course in English.

To that course, which is intended to produce well-educated veterinary surgeons, the writer proposes to devote the remainder of this article which will include a description of the College, its equipment and the great facilities it possesses.

In 1915 the College was entirely rebuilt on its present site, the previous site and buildings being taken over by the Medical College which adjoined it. It is very commodious and self-contained. The Great War interfered with the purchase of new equipment, but since then the Punjab Government has demonstrated its appreciation and generosity in a practical way and the Punjab Veterinary College is

almost certainly as well or better equipped than any other Veterinary College in the world.

THE COURSE OF STUDY.

As previously stated, the course of study extends over four years and the medium of instruction is English. Each year consists of a session of three terms. A session extends over nine months, with a few days holiday between terms at Christmas and Easter. Between sessions there is a vacation of three months for climatic reasons.

Admission is restricted to students whose minimum qualification is the matriculation examination of the Punjab University or equivalent test. In addition applicants for admission have to be approved by the Principal after a personal interview and must possess a medical certificate of freedom from disease and good eyesight. A written

FIG. 1.—Punjab Veterinary College—Riding Class.

examination in general knowledge and a practical examination in the handling of animals is also required before admission. On passing the final examination the students are given the diploma of Licensed Veterinary Practitioner, Punjab (L.V. P., Punjab).

The University Authorities have suggested that the course be recognised as a University course, the College being affiliated. In that case a degree (B.Sc.) would be given instead of a diploma. Negotiations are in progress which might involve some minor alterations in the course of study.

The subjects taken in the first year are :—

Chemistry and Elementary Physics—125 lectures and 80 hours' practical instruction.

Biology—Elementary Botany and Zoology—75 lectures and 100 hours' practical instruction.

Animal Management and Handling of Domesticated Animals—25 lectures and 100 hours' practical instruction.

Riding—as required.

Students not engaged in riding are, in addition, detailed to assist in the outdoor clinic every morning for two hours. They obtain, therefore, considerable practice in handling and securing animals, including the administration of medicines and the application of surgical dressings. The work is performed under the supervision of the officers and senior students on duty in the clinic. The average daily attendance at the outdoor clinic, which is open for two hours every morning, is about 50, the greater proportion being cattle and buffaloes.

Contagious cases and canine patients are treated in separate wards. The conveniences and appliances are ample and up to date. They include washing boxes, casting beds, and stocks of various descriptions. There is a dispensary at hand where prescriptions are made up. There is also a dark box fitted with electric light in which examinations can be conducted. Riding is taught by an instructor trained in the Army and classes are held both morning and evening. A jumping lane is provided. Ten students form a class and the examination at the end of the first year includes the passing of a satisfactory test in riding.

Chemistry and Physics are taught by a full-time B.Sc. of the Punjab University, and there are well equipped separate laboratories for practical work in these subjects.

Biology is taught also by a full-time B.Sc. of the Punjab University and the course includes a considerable amount of practical work with the microscope. This is taught in the Physiological Laboratory in which there is accommodation for some 25 students. The equipment is satisfactory and fresh subjects are obtained for dissection as required.

Animal Management is taught by the Hospital Surgeon and includes instruction in the management of elephants and camels.

In addition, instruction in English is provided in the first year, the services of a teacher being obtained from the Central Training College of the University.

Minor Anatomy (Osteology and Arthrology of the Horse) was at one time taught in the first year, but two years ago it was decided to teach the whole subject of anatomy in the second year, as an experimental measure. This has proved to be disadvantageous in some respects, and it is now proposed to revert to the former system. The examination in anatomy will, however, take place at the end of the second year. It has been found that, in order to commence the dissection of the horse at the beginning of the second year, a previous acquaintance of equine osteology and arthrology is desirable.

The work in the first year is sufficiently crowded, but it will probably be found convenient to take English for the first half of the first year and Minor Anatomy during the second half.

Examinations are held in Chemistry and Physics, Biology and Animal Management at the end of the first year, and students who do not pass are not permitted to proceed to their studies in the second year. Those who fail in one subject only are, under certain conditions, allowed to go up for a supplementary examination at the end of the College vacation which extends over three months. If they do not pass they have to put in another year's study and pass in all the subjects again.

This system prevents any interruption in continuity of study.

The subjects for the second year are :—

The Anatomy of the Domesticated Animals—125 lectures and 300 hours practical work.

Physiology and Histology—125 lectures and 50 hours' practical work.

The Principles of Shoeing, including instruction in the removal of shoes and the preparation of the foot—25 lectures and 50 hours' practical work.

There is an excellent Dissecting Room, equipped with two of Bradley's Dissecting Machines. Horses are the type animals and subjects are freely supplied. They are preserved by the injection of formalin and keep satisfactorily for a month to six weeks. In addition, sheep and dogs are thoroughly dissected. Demonstrations are given on other animals and on fowls.

There is also a well-equipped Anatomical Museum in this department of the College.

Anatomy is taught by a graduate of the College, who is a B.Sc. of the Punjab University, and has received the advantage of a year's training under Professor Bradley at the Royal (Dick) Veterinary College.

There is a separate Lecture Room for Anatomy and Physiology and the Physiological Laboratory is thoroughly well equipped with necessary apparatus, including an electric kymograph. An epidiascope is also available for lantern slides and illustrations.

Physiology and Histology are taught by a graduate of the College, who, in addition to having been through the course in Physiology at the Medical College at Lahore, spent two years at University College under Professor Starling, where he was able to assist in physiological research.

There is a shoeing forge within the College precincts in charge of a

well qualified Anglo-Indian farrier, who teaches the students' and farriers' classes.

The examinations in the above subjects are conducted at the end of the second year on the same principle as obtains at the end of the first year.

The subjects for the third year are :—

Pathology, including Bacteriology and Parasitology—125 lectures and 100 hours' practical work.

Veterinary Hygiene and Dietetics, including the principles of breeding, animal husbandry and animal dentition—75 lectures and demonstrations.

Pharmacology, including Materia Medica, Pharmacy and Toxicology—125 lectures and 50 hours' practical work.

Clinical Diagnostics—50 lectures.

Minor Surgery—50 hours of practical work.

The Pathological Department comprises a separate lecture room which can be darkened for demonstrations with the epidiascope, separate laboratories and offices for the professors of Pathology, Parasitology and Hygiene, a students' laboratory capable of seating 25 students, a kitchen, a sterilising room, a cellar for storing sera and vaccines, an incubating room and an artist's room with a micro-photographic apparatus and dark room. In addition a *post-mortem* house and a house for small animals are provided. A refrigerating cabinet is being installed. The apparatus including the epidiascope, the centrifuges, the stills and the microphotographic apparatus are served with electric power. A gas plant supplies the incubators and the numerous gas burners in the laboratories.

Attached to this department is the Contagious Ward, in which there is separate accommodation on a liberal scale for different species of animals and various incinerators. The Professor of Pathology possesses the qualifications of M.R.C.V.S., D.V.H., and is in charge of the department.

The Professor of Hygiene is a M.R.C.V.S. and a B.Sc. (Punjab), and he teaches Meat and Milk Inspection to the fourth-year students in addition.

The Professor of Parasitology is a graduate ot the College with experience in Africa. He has studied the subject also at the Molteno Institute at Cambridge and at the London School of Tropical Medicine. The subject of Parasitology is given special attention at the College owing to its great importance in India.

Pharmacology is taught in the main College building in which a special room is set apart for Materia Medica specimens attractively arranged.

Dispensing is taught in the Chemical Laboratory in the same building.

The Professor of Pharmacology is a graduate of the College who has taken a special course in the subject at the Medical College, Lahore.

Clinical Diagnostics and Minor Surgery are taught by the assistants to the Professors of Medicine and Surgery respectively, under the supervision of the latter officers.

The third-year students are detailed every morning to work in the Cruelty Ward, which forms a special department, and are thus enabled to obtain practical experience in minor surgery.

They receive a very complete course of practical laboratory work and are enabled to see a large number of cases of contagious disease and *post-mortems*. In this department a certain amount of research work is conducted and a number of sera and vaccines are prepared.

Anti-rabic vaccine is a speciality of the department and certain sera are supplied to officers of the Medical Department. A number of morbid specimens are examined. In short the students have unique advantages for obtaining practical experience of the various branches of pathology with living and morbid material.

At the end of the third year examinations are conducted in pathology, etc., hygiene and pharmacology on the principles previously explained. Class examinations are held in clinical diagnostics and minor surgery and students who fail in these are detailed for duty during the summer vacation.

The subjects for the fourth year are :—

The Principles and Practice of Veterinary Medicine—125 lectures.

Meat and Milk Inspection—50 hours.

The Principles and Practice of Veterinary Surgery—100 lectures and 100 hours' operative surgery.

Obstetrics—25 lectures.

Hospital Practice—300 hours.

In this year the lectures are given in the two lecture theatres in the main College building, one of which can be darkened for lantern slides. Meat and milk inspection is taught by means of lectures, practical demonstrations and visits to neighbouring dairies and slaughter houses.

The Hospital comprises indoor accommodation for 60 horses and cattle in the general ward, and as before stated there is a large outdoor clinic. In addition there is the Cruelty Ward for animals sent in by the Society for the Prevention of Cruelty to Animals, the Contagious Ward and a special Canine Hospital, which is well equipped with general and isolation wards and a special operating theatre for small

animals. There are two operating theatres for the larger animals. One is equipped with an excellent operating table for horses and cattle and a gallery for students. An X-ray apparatus of the latest pattern is about to be installed in this theatre, which will enable radio-photography and radiotherapy to be taken up.

The assistant to the Professor of Surgery has been trained for this work at the Dehra Dun Institute.

In connection with this installation an electrocution apparatus for dogs and cats, similar to that used by the Animal Rescue League at Islington, has been sanctioned, and will be installed in due course.

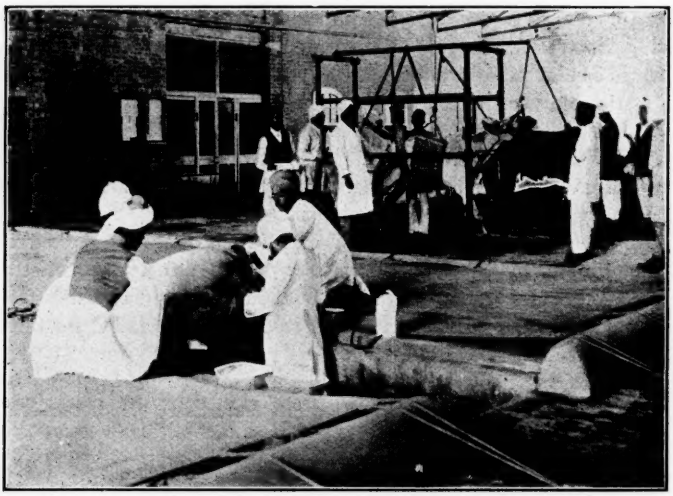

FIG. 2.—Punjab Veterinary College—Outdoor Clinic Shed.

The second operating theatre is used by the students for operations on dead animals which are supplied in adequate numbers.

Veterinary Medicine is taught by the Principal and the Professor of Parasitology. The Professor of Hygiene teaches meat and milk inspection.

The Professor of Surgery and Obstetrics is a M.R.C.V.S., who also supervises the hospital practice.

The Professor of Physiology is in charge of the Canine Ward.

Clinical assistants, who are graduates of the College, are employed in each branch of hospital practice.

Students are detailed for duty in the hospital during the vacation by turns.

On passing the fourth or final year's course of study students are given the diploma.

In addition to the course of study above described, post-diploma courses are provided for qualified men who are sufficiently conversant in English. There are two courses of nine months each. One involves attendance at the lectures and classes in zoology, histology, pathology and parasitology, and is intended to provide instruction in pathology and laboratory work for veterinary assistants who took the three years' vernacular course and might be expected to be capable of absorbing the more advanced study. The other is merely a refresher course and involves attendance at the lectures and demonstrations in the fourth year of study.

A course is given in shoeing and extends over nine months. It provides instruction in all branches of shoeing for farriers in the mounted branches of the army, and for civilians.

Fig. 3.—Punjab Veterinary College—Outdoor Clinic.

The College Buildings.

The College Buildings are commodious and well arranged in extensive grounds. The main building is double storied and comprises two lecture theatres, a chemical laboratory, a physics laboratory, a materia medica museum, a students' room and lavatories on the ground floor. Above are the Principal's office, the clerks' offices and record room, the general museum, the library and the staff room. The general museum and the library are large and well furnished, and the reference and other books in the library are a special feature.

The pathological, anatomical and clinical departments have been already described. There is a special weighbridge for horses and cattle. Dutch barns for fodder and store rooms are conveniently

provided. A large proportion of the teaching staff and most of the menial staff are provided with residential quarters. Adjoining the College is the hostel for students, and the playing field. At present the hostel is accommodated in buildings that were not originally built for the purpose, but it is shortly to be entirely reconstructed on modern lines, accommodation being provided for 200 students.

Students who do not reside with their parents in Lahore are not permitted to live outside the College unless they obtain the express permission of the Principal.

Athletic sports are encouraged, and football, hockey, and tennis matches are arranged. Debates and indoor recreation are indulged in under supervision.

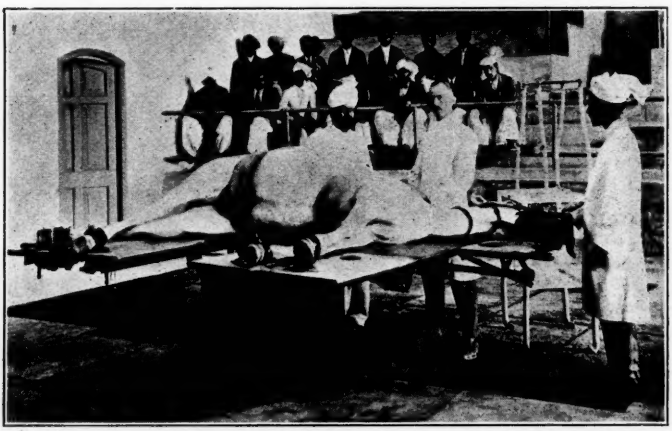

FIG. 4.—Punjab Veterinary College—Operating Theatre.

The water supply of the College and hostel is self-contained. There are three wells, one of which supplies a distributing tower fed by an electric motor. A tube well is to be provided shortly to improve the supply for the grounds. There is a sewerage system which is in process of extension. The electric power is supplied by the Lahore Municipality.

GENERAL REMARKS.

From the above sketch of the College, its personnel, and the instruction provided, it is obvious that progress in veterinary science in the Punjab can be justifiably claimed to have been very great in recent years. The work in the districts does not come within the scope of this communication, but it may be stated that progress in this has been very marked also. The scope is enormous, but it is not

yet thoroughly appreciated by the Indian politician. The economic benefits to an agricultural country like India that can be obtained from a correct appreciation of modern veterinary education and the application of veterinary knowledge are obvious, and a further expansion of state supported activities is essential.

It is the policy of Government to employ Indians as far as possible in the further development of the country, and endeavours are being made to carry that out in the veterinary service. Agriculturalists are mainly recruited in the ranks of the profession, though it is found that, in effect, townsmen assimilate the practical work quite as readily.

In the Punjab Veterinary College Animal Management and Riding are deliberately chosen as subjects in the first year in order that students

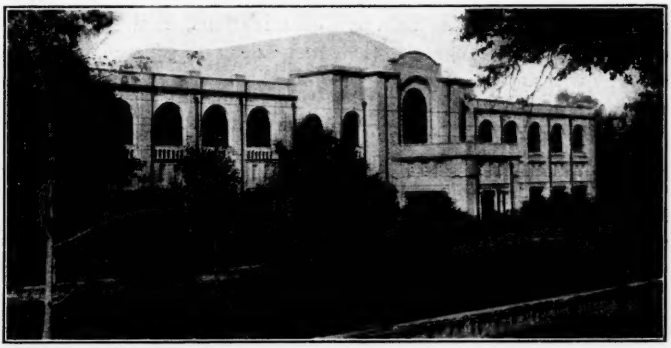

FIG. 5.—Punjab Veterinary College—main building.

who are found unsuitable, or who find themselves unsuitable, for work with animals may retire without wasting their time.

In India there are many peculiar difficulties appertaining to veterinary education. In the first place Indians with any pretension to standing, and who have any natural taste or aptitude for attendance on animals are few and far between. The occupation is looked upon generally as a menial one and even when animals are kept for show or use it is unusual to find an owner who takes sufficient interest to supervise the work of his employées.

The consequence is that animals belonging to Indians are frequently neglected. As they become more valuable increased interest may be expected to be taken, and expenditure in this direction regarded more favourably. In the second place the native of India who is seeking a career for himself or his son is not disposed to allow any natural

taste for a profession to enter into his calculations. He has a preference for employment under Government or for a lucrative calling.

The consequence is that it is rare to find a student who is keen on his profession for the sake of the work in itself, and the veterinary profession, being neither very lucrative nor carrying much status, is overlooked by possible aspirants who have the requisite attributes. Nevertheless, the present-day students of the Punjab Veterinary College are quiet and industrious. Whether they will take any altruistic interest in their profession after qualifying remains to be seen. The course is a stiff one, and the period of study is more than fully occupied. As the students are taught in a foreign language, of which their knowledge is on the whole very inadequate, much time and patience has to be employed by their teachers. Their mentality is such that by great effort of memory they are able to perform prodigious performances in their examinations, both written and practical, but, unfortunately, their memories are, generally speaking, not retentive and their powers of observation are small. The result is that a student will frequently do brilliantly in an examination in, say, histology, and yet be found ignorant in the subject when he takes pathology in the following year. This factor is well recognised at the Punjab Veterinary College and a great feature is made of the practical work in consequence.

As a rule the Indian lacks confidence in his own powers of diagnosis and is apt to rely too much on others, even when he has the knowledge.

In spite of these disabilities remarkable exceptions occur and it may be said that there is some prospect that the exceptions may eventually prove the rule.

It would be an advantage if the course outlined above could be extended over five years instead of four, and a higher preliminary qualification demanded. The expense involved is the great difficulty.

A solution would be to admit only students who had already attained a sufficient knowledge of English, chemistry, physics and biology, and give them a four years' course in the various branches of veterinary science superimposed on a sound scientific education.

THE EFFECT OF PASTEURIZATION ON MILK.

By LT.-COL. C. MADDOCK, C.I.E., M.D., F.R.C.S.E., D.P.H.,
Hon. Sec., "Grade A (Tuberculin Tested)" Milk Producers' Association, Reading.

Pasteurized milk, under the Milk (Special Designations) Order 1923, is defined as milk that has been retained at a temperature of not less than 145° and not more than 150° Fahrenheit for at least half an hour, and is immediately cooled to a temperature of not more than 55° Fahrenheit.

Pasteurization of milk was a method introduced to prolong the keeping qualities and to render innocuous any harmful organisms that had gained access from outside, or were present in the udder of the cow.

The vexed question of the invariable death of the tubercle bacillus in a naturally infected milk is of the utmost importance. C. W. Anderson, in 1924, working in Denmark with a naturally tubercular milk, found as a result of six experiments with this milk, after pasteurizing at a temperature of 145·4° for 30 minutes that one guinea pig developed general tuberculosis.

R. G. White, working at the Lister Institute in a similar series of experiments, found that one out of 30 experiments was positive, but this he is inclined to explain away as an accident.

Recent work at the National Institute for Research in Dairying confirms the view that pasteurization of naturally infected tubercular milk does not invariably kill the tubercle bacillus. Laboratory experiments with artificially infected milk from cultures of tubercle bacilli cannot be of the same value as those dealing with milk from tubercular cows that are secreting tubercle bacilli in their milk.

The question of the destruction of vitamins by pasteurization is a very difficult one to solve. As our knowledge of vitamins increases so does the complexity of the question. It is now universally admitted that the action of the sun's rays and ultra violet light has the action of storing up vitamins in the tissues of the human subject as well as animals. In this way, the effect of diminished sunlight during the winter is as far as possible minimised. It is extremely difficult to form any definite opinion in any observations on the infant, as of course, it is impossible to carry the observations beyond a certain point, and very difficult to judge what effect has been caused by lack of vitamins when the infant has reached adult life, or to know how much finer a specimen of the human race the infant would have been, if it had not been deprived of raw fresh milk containing its vitamins unimpaired at the most critical and vulnerable stage of its life.

That outbreaks of scurvy have taken place following on the establishment of large pasteurization plants, has been shown by A. F. Hess in his work on Scurvy, Past and Present, notably in Berlin in 1901, and when pasteurized homogenized milk was introduced into Switzerland and France. He also states that the condition of latent scurvy is probably the commonest type of this disorder, especially in the larger cities where almost the entire milk supply for infants is pasteurized, and when we consider that the disease takes six to nine months to develop.

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The lessons learnt from these outbreaks of scurvy were that fresh fruit juice and cod liver oil should be given to children when pasteurized milk was the main article of diet.

Dr. Ethel Bentham, at the National Milk Conference, gave it as her opinion that the risk of rickets and the severer forms of indigestion is distinctly greater in cases where milk is subject to any form of pasteurization or preservation.

A very interesting observation by M. Ludd, H. W. Ewarts and L. W. Franks, in New York, on infant feeding was carried out for over six months. The infants were divided into four groups, the first were fed on pasteurized milk alone, the second on pasteurized milk plus orange juice, the third on pasteurized milk plus orange juice and cod liver oil, and the fourth on certified milk which was the only raw milk obtainable in New York. The percentage gain in weights of these different groups showed that those fed on pasteurized milk alone had gained 1·7 per cent. in weight, with pasteurized milk plus orange juice the gain was 7·9 per cent., with pasteurized milk plus orange juice and cod liver oil the gain was 9·5 per cent., whilst those fed on raw milk gained 11 per cent. in weight.

Another very interesting point is the effect of pasteurization on the calcium salts in milk. H. E. Magee and D. Harvey, working in the Rowett Research Institute, Aberdeen, demonstrated that the calcium in milk is in two forms, a soluble one and an insoluble one bound up with caseinogen. After pasteurization the total of the soluble calcium is very much diminished. This loss of soluble calcium as regards infants and growing children must be a very important factor in growth and development, not only in the formation of bone and teeth, but also in the calcium content of the blood, the importance of which is now being realised.

There is no question that children who have been accustomed to raw fresh milk, do not appreciate pasteurized milk.

I am convinced that raw fresh milk has an extraordinary effect on increasing the appetite. This I have observed in the last two years in the case of six children (aged 9 to 17). Four spend their holidays with me and two their term time, as they go to school daily in Reading. They all admit that they never eat so much anywhere else and their daily ration of (T.T.) milk is never less than 1½ pints. I have tried to palm off pasteurized milk on them as raw milk, but they will not touch it, and this I have noticed with many children who are accustomed to fresh raw milk.

As Nature gave raw fresh milk as the only diet for the offspring

of all mammals, I still believe that when man steps in and interferes with Nature that some harm must ensue, and that it is only a matter of time before research work will prove this still more definitely.

ERADICATION OF BOVINE TUBERCULOSIS.

By HENRY GRAY, M.R.C.V.S.,
Earl's Court, London, S.W.

Since I published an article on this subject in the *Veterinary Record* (May 28th), there has come into my hands literature issued by The Free Importation of Canadian Cattle Association of Great Britain, whose Hon. Secretary is Sir John Lindsay, K.B.E., J.P., D.L., Town Clerk, City Chambers, Glasgow.

The 12-page pamphlet on the "Hidden Perils of Milk" gives a fair résumé of "The Case for the Free Importation of Non-Tubercular Canadian Cows and Heifers into Great Britain in the Interests of Public Health," etc., and "Are British Dairy Herds Fifty per cent. Tubercular?"

This association is composed mainly of representatives of English and Scottish Boroughs or Burghs, Chambers of Commerce, Co-operative Societies, Meat Traders' and Cow Keepers' Associations, the Scottish Chamber of Agriculture, etc.

It gives a mass of facts and logical reasons for the introduction of non-tuberculous dairy stock from Canada into this country.

A Memorandum by the Town Clerk of the Corporation of Glasgow of the correspondence that has taken place between himself and the Ministry of Agriculture on the Canadian Cattle Trade, a "Note of Proceedings at a Deputation from the Canadian Cattle Association," received by The Right Hon. Walter Guiness, D.S.O., M.P., at the House of Commons on December 8th, 1925, and a "Minute of Proceedings" at Meeting of Local Authorities and other bodies held in the Caxton Hall, Westminster, London, on March 29th, 1926, are issued and should be in the hands of every veterinary surgeon on the register, 95 per cent. of whom do not know what has been going on concerning this question, which concerns the profession as a whole as much as it does any other body of the public.

Although Canadian dairy cattle may be found free of tuberculosis when they arrived in this country, it does not follow they would remain so after coming in contact with our heavily tainted stock or placed in infected cowsheds. If this country was going to adopt radical eradication of the disease as soon as a district was freed of it there would remain a good case for the introduction of "clean" dairy stock to replace the losses entailed by the destruction of reactors.

If we were to adopt the system being adopted by the United States Department of Agriculture and which has been adopted on a smaller scale by the island of Guernsey, there would be a very great demand for the production of clean dairy stock in this country which could be supplemented with clean dairy stock from Canada or elsewhere, where no acute infectious plagues existed. Again there would also be a greater demand from overseas or abroad for our stock, which could be bought with greater confidence. Furthermore, all other countries would soon follow in our wake since seeing if they did not our markets for their butter, cheese and dead meat would be closed against them. Finally, by freeing our livestock from this fell disease, there would be no necessity to destroy the nutrient properties of milk by boiling, sterilization or pasteurization and its incidence in the human race would fall tremendously as shown by the statistics issued by Dr. Bishop, M.O.H., for the island of Guernsey.

Prevention is better and, in the long run, cheaper, than tinkering with this malady.

Clinical Articles

GRASS DISEASE IN HORSES.
GRASS FEVER, ETC.

By WM. S. LORNIE, M.C., M.R.C.V.S.,
Perth.

At this time of the year grass disease is usually prevalent in certain districts of Scotland, and although most of the general symptoms are well known to practitioners, occasionally one meets with an obscure type. I am quoting a few cases met with a few seasons ago, so that they may be placed on record.

Case No. 1.

Subject.—A Four-year-old Pony. When observed first, this animal appeared debilitated, with a marked tucked-up condition of the abdomen. Pulse 60; temperature 101° F. Borborigmus present, but the fæces were passed in small quantity. The muscles of the back were hard and tense, with a semi-tetanised appearance. The animal sweated in patches, on the body, under the forearm, and particularly under the mane and tail. The corn manger was observed to be half full of chewed hay and grass, and on giving the animal grass or hay to eat, it chewed it a long time, ultimately quidding it into the manger. This accounted for the material found there. The patient was evidently unable to swallow properly, gas was present in the œsophagus, the latter showing typical reverse peristalsis. When the animal did

swallow, the food did not reach the stomach, with the result that the œsophagus became impacted like a sausage, and felt hard on palpation. When this occurred, signs of distress were shown, with symptoms of choking. Emesis would then occur and a quantity of food came down the nostrils, leaving the latter in a dirty green-coloured condition. Previous to this emesis the animal arched the neck muscles, drew back its head, and gave a squeal. The septum nasi had become ulcerated, and the necrotic spots had a red colour, and due to this and to a certain amount of food in the nostrils, and to a partial paralysis of the same, the breathing had a peculiar snivelling sound. The patient could drink water, and was exceedingly anxious to eat, with the usual result, the choking of the œsophagus. When the stomach tube was passed, it relieved the condition for the time being, and the animal would eat ravenously, with the same result, and the vomition repeated. Traumatic pneumonia developed, and the animal was destroyed at the end of 16 days.

POST-MORTEM.—The principal lesions were the following. Spleen, very much enlarged. Congestion of the stomach, and very much dilated. The nasal passages choked with food, and the ethmoid bone necrosed. The œsophagus was impacted with food.

CASE NO. 2.

SUBJECT.—A Three-year-old Colt. This animal was seen casually one day, when passing the farm, and the owner said he was treating him for a slight wound on the off hind leg. About 10 days later, I was passing and saw the colt, and found that he had a tucked-up abdomen, with a slight tetanised condition of the back muscles. He was rather off his feed, and I requested the owner to keep me advised as to his condition in two days time. The information received stated that he was worse, and there was food coming down his nostrils. I found him still tucked-up in the abdomen, with the same tension of the back muscles. There were patches of sweat on the body, and under the mane and tail, and twitching of the skin in places. Pulse 55, temperature 102° F. Breathing was difficult, with a snivelling sound, and fluid and food were present in the nostrils. Grass was given to eat, which he did, as also hay and corn, but he choked with dry meal. He could not drink, the water being returned by the nose. The bowels were irregular, though the fæces were normal. At this point my diagnosis was grass disease, and as the animal had never been at grass, my diagnosis was disbelieved. In spite of new treatment by another veterinary surgeon, the animal gradually got worse, and at the end of three weeks he was in a wretched condition, with all the symptoms exacerbated. Borborigmus was absent, unable to swallow, with regurgitation in the œsophagus, and necrosis of the nasal septum.

Traumatic pneumonia developed, and the patient was very distressed. He repeatedly tried to vomit, and gave a squeal when attempting to do so.

RESULT.—The animal was destroyed by bleeding under chloroform.

POST-MORTEM.—The stomach was enlarged and dilated, and very much congested. The bowels were congested. Spleen enlarged two to three times. Brain congested. Nasal septum and ethmoid bone necrosed.

REMARKS.—This case occurred in the spring of 1920, and I had not seen many cases of grass disease at that time, having only been recently demobilised. It was a typical case, and this opinion was confirmed by the experts who conducted the *post-mortem*.

CASE NO. 3.

SUBJECT.—A Three-year-old Colt. Reported to have colic, and the usual colic drench was given.

SYMPTOMS.—Complete stasis of the bowels, with a peculiar twitching of the upper lip. Temperature 102° F., pulse 50-60 and varying. Noticed difficulty in drenching the animal. Suspected grass disease. The patient did not seem to be badly pained, and was much easier after being drenched. He was turned out as usual the following day, though dull and not inclined to eat much.

In three days' time he had developed all the symptoms of grass disease, trembling of muscles, sweating in patches, and trying to vomit. He died in five days, the peculiarity of the *post-mortem* was the distension of the stomach, and slight impaction of the colon.

CASE NO. 4.

SUBJECT.—A Four-year-old Gelding. This animal was very uneasy, occasionally crouching as if to lie down. The breathing was heavy. Complete stasis of the bowels, and rectal examination showed impaction of the colon, with a brick-like hardness of the fæces, that could not be kneaded with the hand. grass disease was suspected, and a laxative drench was administered. No hardening of the back muscles, or the tucked-up condition of the abdomen was noticed in this case. Next day, same symptoms were shown with occasional muscular tremors, and sweating absent.

On the third day, very much worse. Difficulty in swallowing and quidding food. Presence of food in nostrils, sweating below mane and tail. Drinking water returned by nostrils. On being given water to drink, the animal tried to chew the water and plunged his mouth in as far as possible, ultimately squealing at not being able to swallow.

4th day.—Animal very ill. Heart bounding, emisis pronounced.

Tongue a pale greeny colour and very dry. No movement of bowels. Distressful condition to look at. Animal almost paralysed and hardly able to stand. Destroyed same day. No P.M. made.

CASE No. 5.

SUBJECT.—A Four-year-old Mare. She was seen ill in the evening and showed all the symptoms of grass disease, and died in 12 hours.

Cases Nos. 4 and 5 were off the same farm and were a pair.

CASE No. 6.

SUBJECT.—A Seven-year-old Mare. Showing all the symptoms, unable to swallow, patchy sweats, trembling of muscles, impaction of colon and absence of borborigmi. Temperature 102° F., pulse weak. Abdominal muscles tense. Death in two days.

CASE No. 7.

SUBJECT.—An Eight-year-old Mare with foal at foot. The usual symptoms were shown, but the peculiarity of this case was the heart condition. On entering the box it could be heard beating, and the action was rapid and bounding. The colon was impacted as hard as a brick. The breathing was quick and jerky, as if half paralysed. Abdominal distension, as compared with other cases. The patient died the same evening.

CASE No. 8.

SUBJECT.—A Two-year-old Colt. This case appeared ravenously hungry and could eat grass, drink water, but choked on dry food. It would then vomit and gave a little squeal. It did not seem to be pained, and all the treatment it got was to let it take its chance. It was turned out and became a wretched-looking object. It lingered on for a few months, and then gradually recovered, becoming quite a useful animal.

REMARKS.

I have not ventured to mention treatment given in those cases. Everything has been tried, with no avail, and I have often found the best thing to do after being certain of the case, was to destroy the animal. Attention has been paid to preventive inoculation, and out of six badly infected farms, there has been no recurrence. This may be due to a coincidence, as in certain districts the disease has almost disappeared. One farm in the centre of the six alluded to did not have the animals inoculated, and cases have occurred there at frequent intervals. The question seems to be to persist in inoculation, or pay attention to internal parasites, and finally insurance of the animals is probably the best safeguard financially. Apart from the research work done on this disease, I cannot venture any theory. It may be botulism, or Borna disease. Whatever it is, it resembles tetanus in some of its phases, and in cases that I have had under my care in

recent weeks, there has always been a history of the animal having had wounds on the legs or feet. Case No. 2 was treated for a wound by the owner, and no later than last week, I had a case where the animal received a bad foot injury through tramping on a broken bottle. Its neighbour suffered from wounds on the leg, caused by rubbing, being affected with leg mange. Both have since died from the acute form of grass disease.

ACUTE PULMONARY ŒDEMA.

By L. C. MAGUIRE, F.R.C.V.S.,
Stow-on-the-Wold.

THIS disease seems to be very rare in the lower animals, for with the exception of the case I am about to record, I have not seen any other, nor can I find any record of such a condition in any veterinary literature or text books.

The subject of this disease was a Shire gelding 10 years old, and so far as I could ascertain had not previously suffered from any serious illness. The horse was at work all the morning hauling timber out of a wood with a very uneven surface. This fact is rather significant, as it has a distinct relation to the arteology of the disease. About noon the man in charge noticed the horse breathing very heavily and showing symptoms of grave distress, with frequent coughing and profuse sweating. Shortly after the commencement of these symptoms a white frothy discharge came from the nostrils. When I saw the animal, which was about four hours after the illness appeared, he was standing in a grass field and was exhibiting the following symptoms: The attitude in which he stood resembled that adopted in an acute attack of tetanus– the fore legs wide apart, the neck stretched forward and the head lowered. There was enormous heaving of the flanks —the respirations were 130 to the minute. The most characteristic symptom, however, was the very great discharge of serous, colourless fluid which escaped from the nostrils—it literally escaped from each nostril in the form of a constant stream. Part of the fluid was churned into white froth and the sound of this churning could be easily heard in the trachea.

I was able to diagnose the condition from having previously read of it in a textbook of the practise of medicine, by F. W. Price, M.D.

This disease appears to be common in the human subject. The above textbook defines it as a flooding of the alveoli with serous exudate from the pulmonary capillaries and which occurs with great rapidity.

ARTEOLOGY.—Arterial disease and hypertension are the most common antecedents, but acute or chronic renal diseases and pregnancy

may all act as predisposing causes. The actual exciting cause is often obscure, and probably varies in different cases. A heavy meal, an epileptic fit, or the administration of an anæsthetic may be the immediate cause in those predisposed. In some cases dissociation of the action of the two ventricles has been supposed to be the cause, the right contracting forcibly, while the left is in an enfeebled or asystolic condition. In support of this contention may be adduced the fact that acute pulmonary œdema has been observed after rupture of the chordæ tendenæ of the neutral valve.

It is a significant fact that *post-mortem* examination, in this particular case which I am recording, revealed a rupture of the chordæ tendeneæ of the neutral valve, evidently brought about through the severe exertion the animal had been subjected to immediately previous to the illness appearing.

CAUSE.—The malady usually lasts only minutes or hours, for if relief is not rapidly afforded the patient quickly dies. In this particular case the subject survived just six hours. The death rate from this disease is very high.

TREATMENT.—The most successful treatment is the immediate subcutaneous injection of morphia and atropin ; but if not administered as soon as the symptoms appear this procedure is of very little value.

JOWAR POISONING.

BY CAPT. T. F. ARNOLD,
Royal Army Veterinary Corps.

DESCRIPTION OF JOWAR.—Jowar or Sorghum (*andropogon sorghum*) is a tropical or sub-tropical fodder plant of the sugar cane species, which grows from six to nine feet high. It provides a large quantity of palatable, succulent fodder in a very short time (about 60 days) and requires a minimum of soil moisture. For this reason it is a favourite green crop in hot, dry localities where the rainfall is uncertain.

POISONOUS QUALITIES.—It has long been known that under certain conditions the plant can be poisonous and many cases of Jowar poisoning have been reported from Sorghum growing countries. The reported cases have been chiefly amongst cattle, whose digestion is peculiarly suitable for the elaboration of the active principle. This poisonous principle is a cyanogenetic glucoside which on fermentation produces hydrocyanic acid. It is unevenly distributed in the plant, the quantity varying with the stage and condition of growth. When the crop is about three or four weeks old (approximately 18 inches tall) the poison content is high ; from then onwards it rapidly decreases and when the flowering stage is reached is so small as to render the

crop safe to feed—provided growth has been regular. Sudden growth after it has been stunted, or stunting after good growth, tend to increase the poisonous properties. In the immature plant, *i.e.*, before the flowering stage is reached, the poisonous principle appears to be concentrated in the stalks; in the irregularly grown mature crop, in the new shoots.

Two occurrences of Jowar poisoning were witnessed in Jhansi (U.P. India), during August and September, 1926. The first was due to the irregularly grown mature crop. (It was the third cutting. NOTE: American agriculturalists consider the second and third crops always dangerous.) The second was due to an immature crop which in addition had been irregularly grown.

FIRST OUTBREAK.—On August 7th and 8th seventeen cases of colic occurred almost simultaneously in one unit (R.A. Fld. Bde.). Symptoms were all more or less the same in each case, and all showed a varying degree of tympany. Enquiries led to the conclusion that a large green ration of which the greater portion (10 to 12 lbs.) was Jowar was the cause of the colic. There were two deaths. In some cases relapses occurred after apparent complete recovery—and in all cases after recovery there was loss of appetite and depression amounting almost to semi-coma, lasting two to three days.

Post-mortem examination of one of the fatal cases revealed a ruptured stomach, but in the second case, apart from a large quantity of semi-digested green vegetable fibre (mostly Jowar) and slight inflammation of the pelvic flexure of the double colon, everything appeared normal. Examination of blood smears gave negative results. This case was the first indication that colic *per se* was not being dealt with and Jowar poisoning was suspected. The issue of Jowar by Military Grass Farm was stopped and excessive colic ceased to occur. An attempt was made to prove by analysis that the crop responsible for the outbreak contained prussic acid. Owing to the unknown and doubtful purity of the chemicals used this was not conclusive, although a weak, muddy "prussian blue reaction" was obtained.

SECOND OUTBREAK.—The symptoms observed during the first outbreak greatly assisted in the clinical diagnosis of the second, which occurred on September 26th in the same station, but in a different unit. On September 23rd this unit (Indian Cavalry) commenced to feed on immature crop of Jowar grown in the Regimental Garden. The squadron in which the trouble occurred fed about three pounds of the chopped plant with the night feed on the 25th. This had been cut in the Regimental Garden four hours before being fed. In addition, the horses had grazed for two hours and received 10½ lbs. of other green fodder (guinea grass) during the day. About five o'clock

in the morning of the 26th cases of tympanitic colic started to occur, and in one and a half hours there were 50 such cases. In an endeavour to prevent further cases the whole squadron was exercised, but during the next twelve hours fresh cases and relapses continued to occur. The total number under treatment at 5 p.m. was 61. The following symptoms were observed in the sequence in which they are given and extended over three days (26th, 27th and 28th).

SYMPTOMS.—All cases were at first tympanitic, some excessively so. They all attempted to lie down, but there was little or no tendency to roll. After walking for some time (15 to 30 minutes) there was slight salivation. Having received treatment and exercised for about one to two hours they were allowed to lie down. When the tympany was relieved (two to three hours) a few remained in a recumbent position, but the majority stood with head depressed in stupor or semi-coma. (No narcotics had been given.) On the second and third days the majority lay down, but this was probably due to fatigue and weakness. There were occasional short periods of uneasiness, during which they walked round in small circles usually to the right and then returned to the original position. Slight tympany occasionally recurred during this phase. In nearly every case there was a slimy green discharge from both nostrils, constant regurgitation of gas, and, in some, attempts at vomitation. Cases showing the last symptom were usually fatal. In one case a double stream of green liquid was ejected from the nostrils with great force to a distance of about 1½ yards. Particular note was made of this horse and on *post-mortem* examination no rupture or obstruction of the stomach or intestines could be found. Three horses had convulsive spasms at intervals of one to two hours, during which they threw themselves to the ground with great violence. Cold sweats and intensely cold extremities which remained so in spite of vigorous hand rubbing, were late symptoms of all fatal cases. A constant symptom which occurred about one hour before a fatal termination was a double expiratory movement with a distinct sound dividing the two. Respirations were slow and shallow, getting more so towards the end. Although the pulse was weak and almost imperceptible throughout, the heart continued to beat after cessation of respiration in every case. Temperature, 102·5 to 104° F. With the exceptions noted below, death was immediately preceded by violent delirious bounds, sometimes as many as four, never more, each bound ending in partial collapse, usually on the knees, with the head between them. These death spasms never lasted more than two minutes. In a few cases death took place while the horse was recumbent and comatose, but in all these cases *post-mortem* examination showed that the stomach had ruptured some time before death. Defœcation and

urination were reduced, but not entirely suspended and in most cases that recovered, diarrhœa supervened. At the beginning of the attack visible mucous membranes were normal or pallid, but later in all cases, whether fatal or not, they became congested and showed petechiæ. In two fatal cases, after apparent recovery and no symptoms for four to five hours, slight uneasiness was shown, followed within 15 minutes by the death struggles already described.

MORTALITY.—There were 29 deaths, the first occurring 12 hours and the last about 64 hours after the onset of the symptoms. There were 14 deaths during the first 24 hours and six during the second. Mortality was highest in the earliest cases that occurred. There were 15 cases before 6 a.m. and of these 13 died.

P.M. LESIONS.—Twenty-seven *post-mortem* examinations were made. The principal lesions noted were: Congested lungs, liquid, oily blood, bubbles of gas in heart, and stomach impacted (ruptured in six cases).

TREATMENT.—Treatment was symptomatic throughout, and the only things of importance noted were that physostiganine in 1½ grain doses appeared to have no action whatever in the early stages, and the exhibition of strychnine during the second, semi-comatose stage, accelerated or possibly caused death.

LABORATORY DIAGNOSIS.—Examination of blood smears excluded the possibility of anthrax. Samples of ingesta from stomach and double colon, and blood from the heart and lungs were forwarded to the U.P. Government Analyst. Unfortunately, these were taken from the last two cases that died. The report was that no cyanide or hydrocyanic acid could be detected. Samples of the fodder (Jowar) were sent to the Officer in Charge, Military Food Laboratory, Kasauli, who reported that it should be considered unsafe as a food for animals as it contained a glucoside which formed hydrocyanic acid on disgestion. Owing to the uneven distribution of the H.C.N. and slight decomposition of the sample submitted for analysis, the average glucoside content could not be given.

A PIECE OF STRAW AS A CAUSE OF FISTULA.

BY LT.-COL. RAINEY, C.B.E., M.R.C.V.S.,
Bow.

SUBJECT.—A seven-year-old cart horse with a small intermittently suppurating fistulous opening in front of the neck about the level of the first tracheal ring.

HISTORY.—None, except that the suppuration had existed for some months.

TREATMENT.—A preliminary vertical incision about three inches in length failed to reach the bottom of the fistula, which curved inwards

at right angles. The discharge continued and a fresh search two days later revealed the sinuous continuation (downwards and at a deeper level) of the fistula.

The second operation was successful: the fistula was opened throughout its entire length of about 12 to 15 inches until at the base of the neck the end was reached and the cause discovered—a piece of straw about $1\frac{1}{4}$ inches long.

At some points the fistula ran alongside the left carotid artery, which, in conjunction with the trachea, was exposed over a considerable area.

With a view to the protection of these tissues the upper two-thirds of the wound were temporarily sutured, but on account of considerable swelling and profuse suppuration the stitches were removed a few days later. The wound was then left open and thoroughly irrigated with the hose-pipe (a gentle stream) twice daily: no antiseptic was used after the day of operation.

The animal was discharged from hospital with the wound nearly healed in one month. A dry dressing was applied for a few days and the animal was returned to duty in 38 days from the date of the second operation.

It is thought that the rapid healing was due in part to the avoidance of antiseptic dressings, though due consideration must be given to the extraordinary differences in the *vis medicatrix naturæ* of animals.

It was assumed that the straw originally entered the tissues by way of a strangles abscess, but, in the absence of a full clinical history, it was not possible to confirm this theory.

SEQUEL TO CASTRATION BY LIGATURE.

By FREDERICK HOBDAY, F.R.C.V.S.,
London, and
J. M. WALKER, F.R.C.V.S.,
Ledbury.

THE subject was a pedigree shire colt, $2\frac{1}{2}$ years old, which had been badly ruptured on both sides, especially the right, the bowel being distinctly in the scrotal sac. The covered operation was performed by an ordinary gelder, who used waxed string as his ligature. The operation passed off without any apparent complication until some five or six months afterwards, when one of us (Walker) was called in by the owner, who had noticed an enlargement with a slight purulent discharge in the scrotal region, and who stated that this was gradually getting larger and interfering somewhat with the colt's action.

Thinking it to be a scirrhous cord, an operation was decided upon. Under chloroform the lumps were dissected out in each case, the

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enlargements on the end of the cords (each as large as a Jaffa orange), proved to be fibrous tissue, in the centre of which was a coil of the waxed thread which had been used as the ligature.

Recovery was uneventful.

THE VALUE OF RÖNTGEN RAYS AS AN AID TO DIAGNOSIS.

By FREDERICK HOBDAY, F.R.C.V.S.,
London, and
D. PUGH, F.R.C.V.S.,
Sevenoaks.

The subject was a dark bay shire stallion, 4 years old, which had been cast from one of the principal Shire Shows on the word of three veterinary surgeons, who each certified that the animal had side-bone. Three other veterinary surgeons, who were called in by the owner, gave equally confident opinion that there was no evidence whatever of side-bone present; and, in order to settle the point beyond dispute, a skiagraph was taken, which demonstrated quite clearly that there was nothing abnormal.

Although the animal had, of course, irretrievably lost all chances of competing for the prizes of the Show, the skiagraph, together with the certificates of the other veterinary surgeons, were brought before the governing body and the animal was reinstated as "sound," which meant that its character was reclaimed as being eligible to travel the country as a Premium Stallion; a testimony to the application of modern veterinary science in the elucidation of what would, in our student days, have remained an obscure problem.

A CALVING CASE.

By HERBERT BUCKINGHAM, M.R.C.V.S.,
Norwich.

One Sunday evening, at 6 p.m., I was called to help a cow to get rid of her calf. On arrival I first examined the cow and found I had some difficulty in passing my hand through the os.

Having done this I discovered the uterus was twisted over to the right side to about a third of a turn (partial torsion), the calf, consequently, lying more or less on its side—its head and forelegs were situated in the region of the right flank of the cow.

Being all alone and growing older, the first questions presenting themselves to my mind were: should I ask another V.S. to come to help me, or tackle the job myself?

I had not placed my arm inside a cow for 15 years, but I decided upon the latter course. I stripped, and to my satisfaction, after

exerting a deal of manual exertion I was able to almost put the uterus (and consequently the calf) into a normal position.

Then I secured one fore foot and gently drew it through the os. The other fore foot was further back flexed, and the joints were stiff. However, after a little hard work, I brought it up and into the os, then drew it up level with the other foot. Then I went to work with the head. I had always kept the calf's nose in a straight line to the os, for I was anxious not to let the head side-slip. Then by steady and gentle traction on the fore limbs, the calf's nose came through the os.

I then gave the cow (and myself) about 10 minutes' rest.

In the meantime I had sent for more men to help.

I then started again. I put a strong line looped over both fetlocks of the calf, still keeping the other two lines fixed. I put six men on the lines and applied steady traction, easing up frequently and by degrees the head slowly came into the world.

I eased again for a few minutes and then commenced the traction again and the thorax was born, but the calf " stuck fast " at the hips for a little while, but by pulling the calf sideways one hip came through the dam's pelvis and by pulling the calf to the opposite side the other hip came through and the calf was born—it was a very big one, especially for a small cow.

There was quite as much hæmorrhage from the uterus as I liked at the time, but it ceased and she cleansed a few hours after.

She began to feed and drink at once, and recovered without my seeing her again and I felt proud of my work.

THE PROSPECTS OF THE PROFESSION IN TANGANYIKA.

By J. M. ARMFIELD, M.R.C.V.S.,
Late Government Veterinary Officer, N. Rhodesia, Tanganyika, etc.

THE prospects of the Profession in Tanganyika are very great indeed. There is plenty of work waiting for us in connection with well-known diseases, diseases which require further investigation, stock husbandry, and education of the native. All veterinaries are Government officials; therefore their work takes them beyond purely veterinary matters. Economics and finance must be considered. Little need be said with regard to politics—whether Great Britain retains the mandate and continues to govern the country need not come under our consideration. Any work of ours for good or evil will have a lasting effect on the affairs of the territory. On the other hand the conservation of wealth in a country so rich in natural resources requires our utmost attention. It is estimated that there

XUM

are now approximately 4,000,000 cattle, and the same number each of sheep and goats ; with a considerable number of donkeys.

The area of the territory is 365,000 square miles.

The personnel of the Veterinary Department is :—

EUROPEAN.—1 Chief Veterinary Officer.
1 Deputy Chief Veterinary Officer.
3 Senior Veterinary Officers.
8 Veterinary Officers.
19 Stock Inspectors.
1 Veterinary Pathologist.
1 Assistant Veterinary Pathologist.
1 Laboratory Assistant.
1 Farm Manager (at the laboratory).
1 Storekeeper.
1 Laboratory Mechanic.

AFRICAN.— Veterinary Quarantine Guards.
Veterinary Messengers.

European Officers are allowed eight months' leave after every 20-30 months' work. Thus the number actually working in the Territory is never more than about three-quarters of the number on the roll. Veterinary Quarantine Guards are natives able to read and write a very little, also having had a few months' training at the Veterinary Laboratory. For the benefit of those who do not know the East African, it may be mentioned that these men have considerable limitations. With few exceptions their ideas concerning truthfulness, the taking of bribes, etc., are not in accordance with our recognised code of morals. Generally speaking, they are of little consequence unless actually under the eye of a white man.

The principal diseases are : Rinderpest, East Coast Fever, Piroplasmosis, Anaplasmosis, Pleuro-pneumonia, Trypanosomiasis, Anthrax, Black Quarter, Horse Sickness, Epizootic Lymphangitis, Follicular Mange and Streptothricosis, Fluke in cattle, Cysticerous Bories, Haemondeus Contortus and other similar parasites in sheep ; whilst Tuberculosis, Rabies and Foot and Mouth disease are conspicuous by their absence.

RINDERPEST.—The situation is similar to that of Tuberculosis in Great Britain. Our knowledge is ample for the purpose of complete eradication, but " the powers that be " cannot be persuaded to tackle the question, and so year after year little is done, and most of our work is wasted. The first point to decide is whether the Government want us to exterminate Rinderpest ? If their reply is in the affirmative, then it is our turn to come forward with our schemes. As the Chief Veterinary Officer stated at the Fifth Pan-African Veterinary Conference in April, 1923, the two principal things required are :—

1. Increase of Veterinary staff.
2. Education of native cattle owners, and of all Civil Servants.

The Veterinary Department costs approximately £40,000 per annum. If this sum cannot be immediately increased to at least half as much again, it might almost as well be invested elsewhere. We say "almost" because we realise that even if at present not much headway is being made with regard to the extermination of the most important contagious diseases infecting cattle, yet a Department is being got together and trained; the native cattle owners are being made accustomed to having their stock inspected by us; and both whites and blacks are getting a certain amount of education in veterinary matters—all steps in the right direction.

The above calculations apply to the Rinderpest situation, but can be taken to apply to the general situation, including all diseases, because Rinderpest is practically the only disease that we have been endeavouring to attack seriously. If increase of staff, etc., is needed for Rinderpest work alone, of course it follows that it is more than ever important if other diseases are also to be tackled. My personal opinion is that the Rinderpest situation is quite as bad as it was when I first became acquainted with it five years ago. With regard to educating other officials—as in other parts of Africa—the Government is represented by political officers. These men are put in charge of districts and everything connected with a district is under the supreme control of its Political Officer, so that a district Veterinary Officer acts as an expert adviser to the district Political Officer. At the same time the Veterinary Officer receives his orders directly from the Chief Veterinary Officer at headquarters. These Political Officers are very busy men having their fingers in many pies and doing, of course, very useful work amongst the natives, but it is to be regretted that with very few exceptions they take little interest in our work. As the natives are taught to look up to the Political Officer as their ruler and father, his indifference to veterinary matters has a very serious effect on our prestige with the native.

With regard to the single inoculation process against Rinderpest, personally I agree with the conclusions arrived at a few years ago by our Indian *confrères*. They held that it was useless in a country in which Rinderpest has existed for many years, where the death rate from Rinderpest is low, and where the value of individual cattle is very little. It can be argued that the process is actually harmful as the period of incubation in inoculated animals is longer; therefore, if they contract the disease, infection will remain in the district for a longer time. The only useful purpose it serves is to lower the death rate; but as in many parts this is as low as 5 to 10 per cent., and as

the native does not appear to mind this loss (in many instances much preferring it to our intervention), wholesale inoculation hardly seems justifiable when serum costs the Government at least 1/- per dose to produce. More cattle die annually from starvation than from disease, so the native, who is an inveterate fatalist, says " If they don't die of one thing, they die of another—' shauri ya mungu ' (the will of God)." Double inoculation, as it confers a lasting immunity, is useful. We inoculate transport oxen at the veterinary laboratory for owners and then they are allowed to proceed through country where Rinderpest exists. But we do not use double inoculation as a weapon in our fight for the extermination of Rinderpest, one reason being that the native might resent the high mortality which sometimes occurs in the process.

East Coast Fever is endermic in many parts, and in some places over 50 per cent. of the calves succumb to it, the remainder acquiring practically permanent immunity.

Settlers are content to lose this large proportion of calves rather than exterminate the disease from their own farms by regular dipping. This would appear to be a sound policy until such time as the systematic dipping of all native herds in the East Coast Fever districts can be arranged for. One of the East Coast Fever areas with a death rate of over 50 per cent. amongst the calves lies about 150 miles south of the central railway line. It is over 5,000 feet above sea level, and has been brought very much before the public during the last year because it is there that Lord Delamere is attempting to form a British settlement.

Demodectic Mange is wide-spread and fairly prevalent, but not of great importance at present. However, when European cattle are imported, care will have to be exercised, as they would probably contract this disease in a virulent form and have to be slaughtered. The present method of dealing with it is to persuade the natives to slaughter advanced cases, and to take note of its prevalence and of its geographical distribution. Having obtained the permission of the C.V.O., I carried out the following little experiment in order to study the disease. At the beginning of the experiment all the subjects were suffering from moderately advanced demodectic mange uncomplicated with streptothricosis. They were kept in an open kraal at night and pastured on land where grazing was particularly good, no addition being made to their diet. Two of the calves were suckling calves under six months old, one of which died at five weeks and the other at 10 weeks after the commencement of the experiment. At the end of four months, the result was as follows:—

Animal.	Condition.
Red cow (No. 1)	Condition very good ; no signs of disease.
Red cow (No. 2)	Condition good ; demodex lesions, but great improvement.
Old cow ..	No signs of demodex ; moderate " streptothrix brushes." (The common streptothrix lesion which first appears resembles a small-sized artist's paint brush.)
Red bullock ..	Great improvement ; a few encrusted demodex lesions.
Red and white heifer.. ..	Condition very good ; scarcely any demodex lesions.
Red heifer ..	Condition very good ; demodex lesions ; great improvement ; a few encrusted demodex lesions.

Conclusions.—(1) There were no signs of demodex on either of the calves, so that it would appear that calves do not readily contract the disease from being suckled.

(2) The disease can improve spontaneously, if not cure itself outright.

(3) The age of the subject appears to have no bearing on the course of the disease.

(4) Good grazing may help to cure.

(5) Experiments with drugs may mislead. The improvement in four months in these experimental cases was so noticeable that had drugs been used one would have easily imagined that they had at least helped the cures.

Injecting subcutaneously with solutions of carbolic acid at weekly intervals has been tried several times at the laboratory, but has failed to do any good.

The disease is of importance because it is rather prevalent in the area being opened up for white settlement before mentioned.

Streptothricosis affects the skin of cattle, causing scales. It is the same disease that is found in Nyassaland, N. Rhodesia, and presumably elsewhere. The causal streptothrix can fairly easily be found by making a slide from the moisture under a scab and staining. Like follicular mange, the disease will assume a more important aspect with the arrival of British cattle.

The game warden, Mr. C. F. M. Swinnerton, a recognised expert on "fly," has been very busy experimenting during the last few years. Half the country is "fly country," so that apart from the supreme importance of eliminating sleeping sickness, the opening up of these infected areas for stock raising would be a very fine thing. One only wonders if the Colonial Office would be prepared to double the veterinary staff in the event of the final destruction of the tsetse, and consequent doubling the area of territory under our supervision. But that time is not yet.

It is regretted that space does not allow of the description of the other diseases appearing on the list.

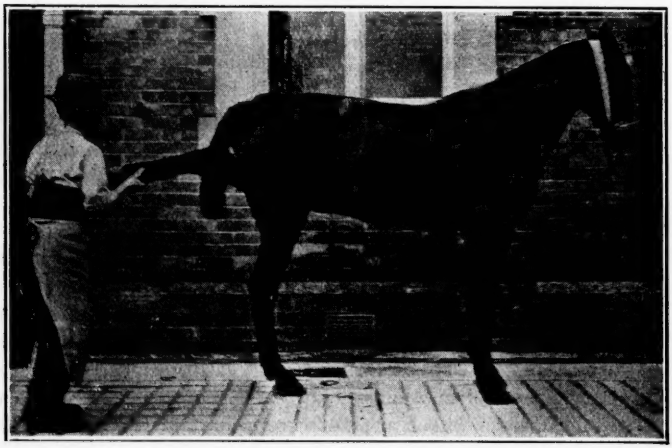
In conclusion, African territories such as Tanganyika are going ahead, and it is up to all of us to take our part in Veterinary responsibilities—naturally there are no small ones in these sort of countries, and the properly equipped Veterinary Officer ought to become an economic necessity.

RUPTURE OF THE FLEXOR METATARSUS TENDON NEAR THE HOCK.

By J. S. WOOD, M.R.C.V.S.,
Parkstone.

THE patient was a nine-year-old well-bred hunter which fell when galloping in the hunting field. The animal was able to walk home, but could not control the movements of the limb.

The photograph shows the amount of backward extension which can be produced, and in addition to this, there was at times a forward



Rupture of the Flexor Metatarsus Tendon.

dislocation of the hock joint, and if forced to move hurriedly, the horse would fall over.

The animal was destroyed as the owner did not wish the expense of a long treatment unless a certain cure could be guaranteed.

CÆSAREAN SECTION IN THE BITCH. OPERATION THROUGH THE FLANK.

By W. R. McKINNA, M.R.C.V.S., D.V.S.M.,
Huddersfield.

AFTER prolonged labour and attempts at delivery with forceps, the perinæum and floor of the abdomen often become contaminated with discharges, and, consequently, it is difficult to thoroughly sterilize the skin when desirous of operating by way of the middle line. Also Cæsarean Section is an operation which has usually to be performed comparatively hurriedly and the usual time of preoperative preparation is not available. Access to the middle line of the abdomen is not easy in bitches with pendulous, heavily charged milk glands, and the after healing of the operation wound is not uncommonly interfered with by the overflowing of milk for a few days after delivery. A supporting bandage to the floor of the incised abdomen always appears to me to be necessary, and such bandages are invariably difficult to maintain in proper position in these cases.

The region of the flank offers an area uncontaminated by discharges, and gives easy access to the pregnant uterus. Puppies delivered by this route are able to the fed by the mother ; a great advantage when a foster mother is not available.

Either flank may be chosen, the one appearing to be most bulky being the preferable one. The whole area of the flank is clipped and dry shaved, wiped over with spirit and well painted with tr. iodine. A long incision is made over the distended horn of the uterus ; and, when exposed, the latter is held in position in the wound by fixation forceps. The uterine wall is incised to allow the introduction of the fingers which grasp the fœtuses, sterile gauze pads being placed between the abdominal wound and the uterus to avoid escape of the uterine fluids into the abdominal cavity.

After extraction of the fœtuses and their placental membranes, the interior of the womb is mopped out with normal saline solution, and the edges then brought into apposition by a layer of closely placed Lembert's sutures. Another series of Lembert sutures is superimposed to this layer in order to ensure a strong union and to eliminate any possibility of leakage into the abdominal cavity. The uterus is then again washed with normal saline solution and tucked back into position in the abdomen, the latter also being mopped with the normal saline

before closure of the external wound. The peritoneum and muscular layers are sutured together with catgut and finally the skin edges are united with interrupted stitches of catgut or silk. The use of catgut for all deeply buried sutures does away with the possibility of suture suppuration, which at times occurs when unabsorbable materials, such as silk, are used.

The external wound is cleansed with ether, dressed with tr. iodine and finally painted with tr. benzoin co. No bandage is applied, as there is no need for support in the flank region, and the probability of hernia formation is remote.

Finally, one half a c.c. of pituitrin is administered hypodermically, this having the effect of contracting the uterus and raising the blood pressure. The latter effect of a cardiac tonic is valuable after the prolonged operation.

I have recently had the opportunity of performing Cæsarean Section on two bull bitches within a few days of one another, and am convinced of the great advantages in choosing the flank region as the site for operation in preference to the middle line of the abdomen.

Similarly, in adopting this method of relief of dystokia in the cat, the results are very encouraging, and the healing of the wound usually causes no trouble in this situation,

It is not suggested that other uterine operations are best approached through incision into the flank. In performing hysterectomy for such a condition as pyometra, entrance of the abdomen through the middle line offers a much clearer field of vision.

THE VALUE OF ULTRA-VIOLET RAYS IN THE PROPHYLAXIS AND CURE OF RICKETS IN MONKEYS.

By E. MARGARET HUME and HANNAH HENDERSON SMITH,
from the Department of Experimental Pathology, Lister Institute, London.

It is now generally well-known that monkeys which are brought to this country are very subject to rickets, when in captivity. Rickets can be prevented by irradiation with ultra-violet light, or by the consumption of a diet, rich in anti-rachitic vitamin. Man has adapted his diet more or less well, to the varying conditions of sunlight all over the world. The monkey does not attempt to do so, and in this climate refuses to consume regularly much beyond fruit and vegetables, none of which contain much anti-rachitic vitamin. Occasionally monkeys will take cod-liver oil or milk in sufficient quantity, but it requires much individual attention to ensure this. A monkey weighing about six pounds probably needs quite as much as half-a-pint of milk a day, to provide enough anti-rachitic vitamin all the year round. Where, therefore, a source of ultra-violet light can be made available,

it affords much the most satisfactory means of protection for monkeys. In the case of other animals kept in captivity, wise observation and experiment are necessary in order to decide whether anti-rachitic treatment should be given by means of light or diet. In the case of lions, for instance, Bland Sutton made it clear years ago, that dietetic measures are entirely adequate.

The different kinds of monkeys vary in their susceptibility to rickets. Some of the African and Asiatic kinds only succumb very slowly, while others, particularly the South American monkeys and marmosets, are highly susceptible; young monkeys succumb much more quickly than older ones. There can be no doubt that the rarity with which monkeys breed in this country, and the still greater rarity

Fig. 1.

with which they rear their young, is very largely due to the unsatisfactory state of their calcium metabolism.

The present note deals with the cure of rickets in a Congo mangabey, and its prevention in a colony of marmosets. The latter was maintained in such health that the animals started to breed regularly.

The Congo mangabey had existed under ordinary menagerie conditions for some three years. In March, 1926, through the courtesy of Lord Rothschild (whose property she was) the writers were permitted to undertake her treatment with ultra-violet light. At that time she could just walk, but could not run or jump. An X-ray photograph of the hand and wrist (Fig. 1) shows the extremely osteoporotic condition of all the bones. The epiphyseal line at the distal end of

the radius and ulna is completely frayed, and the bone merges into the cartilage. Fortunately for the prospect of cure, the monkey appeared to have no other rachitic lesions, beyond the bony ones. The gut had not lost tone so that there was no distension of the abdomen. The coat was rather thin, and the skin of the nose had hard scabs on it.

Irradiation with a mercury vapour quartz lamp (Ulvi-arc, of the Hewittic Electric Co.), two years old, was instituted, and exposures

FIG. 2.

FIG. 3.

of 10 minutes, six times a week, were given. Sometimes the exposure was increased to 20 minutes, but it was never longer. An old somewhat deteriorated lamp of this type does not easily affect the eyes of the animals, nor does it readily cause erythema, but it exercises its anti-rachitic action satisfactorily. As far as the writers have been able to observe, it is quite unnecessary, for this purpose, to produce erythema. They have not, however, been concerned at all with the bactericidal action of ultra-violet light.

After treatment was instituted, the monkey speedily began to improve in activity and already showed marked progress at the end of three weeks. In six weeks she began to run and to jump a little; the scabs on the nose disappeared and the skin of the face was in beautiful condition. Teeth began to erupt and signs of sexual development were visible. After two months of treatment she began to put on weight and to grow. Between May 1st and November 6th her weight increased from $6\frac{1}{2}$ lbs. to $8\frac{1}{2}$ lbs. The coat became excellent and sexual development proceeded; a regular menstrual period of four to six weeks being established.

In November, 1926, after eight months' treatment, the monkey suddenly fell a victim to pneumonia, without any preliminary indisposition. Right up to that time she had shown continuous improvement in activity. She could run and jump well, though not quite normally. X-ray photographs were taken in June after three months' treatment, and in November (*post-mortem*) after eight months' treatment. The first (Fig. 2) shows marked improvement in the calcification of the bones of the fingers, and some improvement in that of the radius and ulna. The second photograph (Fig. 3) shows tremendous progress in both radius and ulna. The epiphyseal line is completely reconstituted and fully calcified, but there is still a large patch of rarifaction in the shaft of each bone. The time during which continued improvement can go on is thus seen to be remarkably long, but the deterioration which the bone had suffered in this patient, prior to coming under the writers' care for treatment, was very great.

The prophylactic observations have been made on a small colony of marmosets, consisting of an adult male and female, a young adult male, and a very young female. The two males were obtained in October, 1925, and the females in March and April, 1926. Each pair was kept in a small cage in a warm, rather stuffy room. The staple food consisted of banana, grape, mealworms, and milk (boiled and sweetened). The cages were carried six times a week, for 10 minutes, to the source of ultra-violet light already alluded to. A fuller account of the general procedure and of the history of the colony has already been published.*

The older male and the adult female were mated in March, 1926, and in August twins, of which one was dead, were born. The gestation period appeared to be about 5 months. The dead twin weighed 30 gms.; the surviving one appeared to be about the same size and perfectly healthy. It grew and throve uninterruptedly, and in March, 1927, it weighed 300 gms., though still of a very infantile appearance, suggesting that its size was above the normal for its age. In February,

* *Proc. Zoo. Soc.*, 1927. (In the press.)

1927, it had to be separated from its parents, as twins once more made their appearance, of which one, in this case also, was dead. The survivor again throve and seemed, if possible, more vigorous than the first born. The mother remained in excellent condition throughout.

As regards the other two members of the colony, the young male and young female were also after a time, mated. When bought the young female weighed only 107 gms. and was in poor condition, with a severe septic condition of the hand, due to the loss of the joint of one finger, probably in the process of capture. Under irradiation this condition eventually cleared up completely; the animal put on weight steadily. In March, 1927, she weighed 370 gms. and appeared to be pregnant.

In the case of all the four imported marmosets, it was noticed that when irradiation was begun, regardless of the time of year, the animals would shed their coats, till the tail was almost bare. Then the hair would begin to grow again abundantly, and in four to six weeks from the beginning of irradiation, the animals would have a luxuriant growth.

Although the period of irradiation was only 10 minutes, the writers attribute their success to the fact that rays from an effective lamp really reached the monkeys. In any attempt at general prophylaxis it is vital that this should be the case, and a failure would indicate that effective radiations were not reaching the animals. It is known from countless experiments that even two minutes' exposure will suffice to protect rats on a rickets-producing diet. The brevity of the exposure needed, coupled with the proved efficacy of the treatment, seem to mark out the mercury vapour arc as making an economically sounder installation than could be provided by filament lamps. It is necessary that exposure to the latter should be very prolonged, and even then their efficacy for the particular purpose under discussion is very problematical.

LONGEVITY IN A CANARY.

By E. FAIRHOLME, O.B.E.,
Sec., Royal Society Protection Cruelty to Animals, London.

The sudden death of a pet canary from internal hæmorrhage reminds me that the bird was, to my certain knowledge, in its nineteenth year, having been bred by the donor and given to my daughter as a fledgling. Is not this age almost a record for a canary?

Abstracts of Current Literature

Lehmann, W.—The Significance of Clitoridectomy in Nymphomania of Mares.—*Schweizer Archiv. f. Tierheilkunde*, April, 1927.

L. gives 10 authors' instances from veterinary literature of recorded

cases of the benefits of clitoridectomy in nymphomania. In some of the cases clitoridectomy followed ovariotomy and cured where ovariotomy alone had failed, and in others clitoridectomy alone cured the complaint.

The technique of the operation is very simple. The instruments required are curved scissors (Coopers) a probe-pointed bistoury and a hook forceps with long arms. The mare is cast or put on the operation table and suitably hobbled. General narcosis, on account of the operation occupying a couple of minutes, is seldom practised. Very dangerous and exceptionally irritable mares are given a full hypodermic dose of morphia hydrochloride a quarter to half an hour before the operation, enabling the animal to be easier cast and hobbled. The vulva and its neighbourhood are freed from secretions by swabs soaked in benzine, afterwards cleansed with spirit and finally disinfected with a 1 in 1,000 corrosive sublimate solution. The lips of the vulva are held apart and pressed down and the clitoris protrudes and is swabbed with lysol, dried and painted with a 5 to 10 per cent. cocaine solution. The twitch is put on after waiting a few minutes. The operator then fixes his forceps and takes a deep hold of the clitoris and the mucous membrane is cut around ; the clitoris is then snipped off deeply with sharp scissors. Hæmorrhage (which is slight) is checked with liquor ferri perchlor and iodoform powdered on the wound. No after treatment is necessary. Casting of the mare is not absolutely essential, but for the safety of the operator and comfortable working it is advisable.

Theodore Schmidt operates with the cautery. He dissects out the clitoris and cauterises the wound with the Paquelin cautery or burns out the clitoris without previous dissecting. In the event of after hæmorrhage he tampons with liquor ferri gauze and puts a suture over the tampon.

Petersen, A.—Infectious Nasal Catarrh or "Snuffles" in Swine and its Treatment.—*Maanedsskr. f. Dyrl* 38, Vol. 1, p. 1-23.

THE author considers snuffles as a primary infectious nasal catarrh which may become acute and lead to death by attacking the central nervous system or causing aspiration pneumonia, or in the chronic form lead to an advancing atrophy of the mucosa, the conchæ and the ethmoid bone, bringing about deformity of the skull and chronic purulent discharges. He has treated it successfully with iodine in the form of Lugol's solution, 15 drops or more being given twice daily in warm skim milk or buttermilk in winter. New bought animals should be treated, for two or three weeks or longer, with the solution as a prophylactic.

Reviews

The Principles and Practice of Meat Inspection. By GERALD LEIGHTON, M.D., D.Sc., F.R.S.E. London and Edinburgh: Hodge & Co., 1927. Pp. 465. Price 25s. net.

THE name of Dr. Gerald Leighton is well known in connection with meat inspection, and his new volume is welcomed as an authoritative work on a subject which has now taken its rightful place as an important branch of Public Health work.

The subject is treated as a branch of Comparative Pathology, and as such, the volume is divided into two sections, i.e., General Principles, and Special Conditions met with in the various regions of the Carcase.

Two appendices are added dealing respectively with the cutting up of meat carcases and forms of records for abattoirs.

The book is amply illustrated, and most of the photographs successfully convey their purpose.

A thorough knowledge of his subject leads the author to assert that only those who have had a training in veterinary anatomy, physiology, pathology and bacteriology, and who have specially studied the pathology of meat, are competent to pass judgment on the condition of a carcase.

This work is specially recommended to those who are studying for the D.V.S.M., and should be in the possession of every veterinarian who performs the duties of a Meat Inspector.—F.

Pedigree Dogs as Recognised by The Kennel Club. Written by leading authorities and edited by C. C. SANDERSON; and with an Introduction by Professor F. T. G. HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E. London: T. Werner Laurie, Ltd. Pp. 359 and 143 illustrations. Price 21s. net.

MR. SANDERSON is to be heartily congratulated on the very successful results of his efforts to co-ordinate information regarding the 70 odd pedigree breeds recognised by the Kennel Club. In his foreword, Mr. Sanderson says that his "aim has been to provide a book which may further stimulate the ever-growing interest of the general public in dogs" and indeed, there could be no better champion of the Doggy World, than this book which, without partiality or advertisement, plainly puts before us the character and form of these time-honoured friends.

The publishers, too, are to be complimented on producing a very handsome volume. A book well bound is like the weary traveller's light in the window—an invitation to enter. And entering here, one finds a worthy presentation of "The only creature faithful to the end." One could not wish for better fare.

A separate section in the book, in which is given the history, standard of points, and general information, is devoted to each breed; and excellent photographs, illustrating dog and bitch champions are prefixed to each section.

This is a book which should find a place on the bookshelf of every veterinary surgeon who is interested in canine practice.—Y.

Animal Nutrition and Veterinary Dietetics. By R. G. LINTON, M.R.C.V.S. Edinburgh: W. Green & Son, Ltd., 1927. Pp. 399. Price 21s. net.

WITH this book, Professor Linton has added another volume to the

Edinburgh Veterinary Series, and the very high standard aimed at and consistently maintained by the series has again been realised by the inclusion of this volume.

In his preface, Professor Linton acknowledges the valuable assistance he has received from his collaborators—a formidable group of experts—but even with this in mind, we feel that the author deserves high appreciation for personal hard work and the thorough treatment he has given to this highly technical subject.

The book is divided into six sections, headed respectively, Composition and Functions of Foods, their Nutritive Value, Preparation and Storage; The Feeding of Animals, and Some Foods which are Harmful; and there is an Appendix of tables dealing with Weight of Foods by Measure and their respective Composition.

The illustrations have been carefully chosen and are well placed.

To every veterinary surgeon, and particularly to those who practise in agricultural districts, this book is recommended as one of the classics in its subject.

A History of the R.A.V.C. By Major-General Sir FREDERICK SMITH, K.C.M.G., C.B., F.R.C.V.S. London: Baillière, Tindall & Cox, 1927. Pp. xi+268. Price 21s. net.

THIS work, dedicated to the memory of William Percivall, the first veterinary surgeon to receive a commission as an army veterinary surgeon, and written for the R.A.V.C. Officers' Fund, is the outcome, as the author himself tells us, of a life-long study of military history, particularly that relating to the Veterinary Service.

The result is a work packed from cover to cover with facts gathered from the original sources, and set out in an orderly and interesting manner.

It tells of the early struggles for recognition, the successes and the failures, the difficulties overcome and the prejudices lived down. The reader watches the organisation grow, until, tested by the Great War, it was able at short notice to expand itself into a cadre of 1,681 officers and 40,000 men.

The part played by the different Directors-General in the moulding of the Corps is told with singular insight, and with the frankness, untinged with prejudice, of the mind that comprehends the difficulties to be overcome.

That the work will be eagerly read by officers of the R.A.V.C. is undoubted, but it has an interest and an appeal for all those who desire to extend their knowledge of the history of their profession. It is illustrated with drawings in colour of the various uniforms worn by the officers of the Corps at different periods, by photographs of some of the Directors-General, and other pictures.

This work will undoubtedly enhance the author's reputation as an historian. It lays not only the R.A.V.C., but the whole profession under a debt of gratitude, for immense as the task has been, it has been undertaken for no other purpose than as a free offering to his profession of one whose life has been devoted to its best interests.

Copies of this work can be obtained from the Officer i/c., R.A.V.C. Records, The Common, Woolwich, S.E.

XUM

Lehrbuch der veterinarmedizinischen Rontgenkunde fur Tierarzte und Studierende der Veterinarmedizin. By DR. PAUL HENKELS. Berlin: Paul Parey, 1926. Pp. 266, 92 plates. Price 21s.

WITH this volume Dr. Henkels satisfies a long-felt want. The science of Röntgenology is well established in veterinary practice, but an authoritative handbook on the subject as specially applied to veterinary surgery, has been strangely lacking. In this volume the subject is fully treated, commencing with a chapter on the origin and development of the science. The technique is admirably set out and here, as in the whole book, the photographic illustrations are excellent. There are extensive chapters on Röntgen diagnostis, Röntgen photography, normal anatomy and pathological anatomy and Röntgen Therapy, and a carefully prepared bibliography is appended. This volume is unreservedly recommended to every practitioner who interests himself in this fascinating branch of diagnostics, and its translation into English is eagerly awaited.

Personal

CAPT. V. PRIDE-JONES has been appointed as Veterinary Surgeon to the Jockey Club at Newmarket in succession to Mr. E. W. Livock. For some time Capt. Pride-Jones has been acting as Veterinary Surgeon to the King's racing establishment at Newmarket, and his name will be remembered by the Profession and the general public as having been in veterinary charge of the very valuable colt Papyrus on his notable journey to the United States to meet Zev.

Congratulations to MAJOR R. C. TENNANT, M.V.O., M.R.C.V.S., who is Veterinary Surgeon to His Majesty the King at Windsor, on being made a Member of the Victorian Order.

Amongst distinguished colleagues at present on a tour visiting the British and Continental Veterinary Schools, we have been pleased to welcome RAI SAHIB DABAKAR DEY, Assistant Principal of the Bengal Veterinary College, India.

Publishers' Notices

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Copy of advertisements should be in the hands of the publishers—Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than 23rd.

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